range of the plateau of Thibet. Southern Tsaidam is an immense flat land, formerly the bottom of a lake, covered with brush-wood at the foot of the mountains, and with salt clay elsewhere. A narrow salt lake, Dobasun-nor, extending west to east, receives the rivers Bayan-gol, Naidmin-gol, and Umu-muren. Pheasants are numerous in the brush and the small marshes covered with rush. Other birds, even migratory, are very few, as also the mammals, which must avoid a ground impregnated with salt. Only bears coming from Thibet are numerous when the fruits of the *khormyk*-brush are ripe. During Chingiz Khan's time the legend says, the region was inhabited by agriculturists, "Mongasy," who left their traces in irrigation canals; but now all Tsaidam is peopled only with Mongols, thinning in the south, living on cattle-breeding. The Umu-muren is the western boundary of the plains impregnated with salt of the southern Tsaidam. Further north and north-west, as far as the Altyn-tagh Mountains, extends an immense dry desert, the soil of which consists of clay, sand, and gravel. Several of its parts man never visits, and only savage camels wander on its barren surface. M. Prjevalsky met with only two places having plenty of fresh water and grazing grounds: at Hansy and at Has, where a lake of the same name has a circumference of nearly thirty miles. Two Cossacks were sent from Has to discover a route towards Lob-nor, and after a fortnight's searching they succeeded in finding a place reached by M. Prjevalsky in 1877.

Leaving at Has some provisions under the guard of seven Cossacks, the remainder of the party went west to explore the valley nearly 150 miles long between the Altyn-tagh, in the north, and the Kuen-lun, in the south; the valley slowly rises from 9000 feet at Has to 14,000 feet at the junction of both chains of mountains. An easy passage across the Altyn-tagh leads them to Cherchen, and must have been utilised formerly on the route from Khotan to China, while another route led, *viâ* Lob-nor, to the Sa-cheu oasis.

The excursions of the party around Has took fifty-four days, during which a region absolutely unknown before was explored. It has a very poor flora and fauna; of mammals only a hundred antelopes were shot, and a new species of *Ovis* has been discovered. M. Prjevalsky gave it the name of *Ovis dalai-lamæ*.

Most valuable geographical discoveries were made with regard to the central part of the Kuen-lun. In the longitude of Hansy this immense border-range of the Thibetan plateau is snow-clad, and reaches, under the name of Jin-ri, the height of 20,000 feet. To the east of this mountain-mass runs a chain named Marco Polo, which is accompanied on the north by a series of ridges parallel to it, and described under the names of Garynga, Dzukha, Toroi, and several others, until the Burkhan-buddha range. To the north-west of the Jin-ri, another snow-clad range, named "Columbus" by M. Prjevalsky, followed by a third range, also snow-clad and formerly unknown, continues further, to join the Altyn-tagh. A range, which has been seen only at a distance, and called "Problematic," runs due west of Jin-ri, and probably reaches also the Altyn-tagh; a high range, 12,500 to13 ,000 feet above the sea-level, including an elongated salt lake, which does not freeze in winter, occupies the space between the "Problematic" ridge and those situated towards the north.

The climate of the region is very severe. In December the temperature was seen to fall during the night below 40° Cels. Day and night strong westerly winds were blowing, often taking the force of a gale which filled the atmosphere with sand and dust. Snow was very scarce; so also must be the rains in the summer, as far as one may judge by the barrenness of the region; this part of the Thibetan mountains must escape the influence of the south-westerly monsoons of India, which bring so much moistness to North-Eastern Thibet. Water, however, is not scarce; the snow-summits supply many small rivers which flow from the mountains. Remains of summer-stations are seen on these rivers and streamlets, people coming there in search of gold, which seems to be as usual in North-West as in North-Eastern Thibet.

Returning in January to the station of Has, M. Prjevalsky resumed his journey to Lob-nor, 170 miles distant, where he was well received by his former acquaintances. There he proposed to stay throughout February to study the migrations of birds.

As known from his telegrams dated June 20 and July 13 (received on August 31), the expedition reached Keria, but was prevented from penetrating thence into Thibet, and the indefatigable traveller proposed to march on Khotan, and thence to Aksu.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

CAMBRIDGE.—The Class List of the Mathematical Tripos Part III., just issued, for which only wranglers can enter, contains in the first class the names of Messrs. Barnard (Emmanuel), 4th Wrangler; Berry (King's), Senior; R. Holmes (St. John's), 5th; Love (St. John's), 2nd; Richmond (King's), 3rd; and Roseveare (St. John's), bracketed 6th. Thus it includes the first five Wranglers, and one of the two bracketed sixth. The names are in alphabetical order.

The Sidgwick Prize has been awarded to Mr. T. Roberts, B.A., St. John's College.

The long list of lectures for this term, issued by the Special Board for Physics and Chemistry, includes, in addition to the ordinary courses of Prof. Liveing, Prof. Dewar, and Mr. Main, Mr. Pattison Muir's, on Principles of Chemistry; Dr. Kuhemann's, on Methods of Analysis and Principles of Organic Chemistry; and Mr. Heycock's, on Chemical Philosophy.

Demonstrations and practical courses suited to the various classes of students, will be given in the University, St. John's, Caius, and Sidney College Laboratories, and Prof. Liveing gives a course of Spectroscopic Chemistry; and Mr. Robinson, one on Chemistry as Applied to Agriculture.

The courses of Physics include Prof. Thomson, on Magnetism; and lectures on various branches by Messrs. Atkinson, Glazebrook, Shaw, and Hart; and practical courses at the Cavendish Laboratory. Elementary and Advanced Demonstrations in Mineralogy will be given.

Prof. Stuart is lecturing on Theory of Structures.

In Geology Prof. Hughes begins a course of lectures on a district to be visited at Easter on January 26, and also lectures on the Principles of Geology. Other work is divided among Messrs. Teall, T. Roberts, Marr, and Harker.

In Physiology the usual lectures are being given by Prof. Foster, Drs. Lea, Gaskell, and Hill, and Mr. Langley. Prof. Macalister lectures on the Organs of Digestion and Reproduction; Prof. Newton on the Geographical Distribution of Vertebrates. Mr. Hans Gadow's course is on the Morphology of the Sauropsida (recent and extinct); other courses are conducted by Messrs. Sedgwick, Harmer, and Weldon.

Dr. Vines's general elementary course of Botany is continued, supplemented by Mr. F. Darwin on the Biology of Plants (advanced); Mr. Gardiner on the Anatomy of Plants (advanced); Mr. Potter's demonstrations on Advanced Systematic Botany.

Advanced work in Mathematics is represented by Prof. Stokes on Physical Optics, Prof. Adams on Lunar Theory, and Prof. Thomson on Electro-magnetism. Mr. Glazebrook is lecturing on the Theory of Light, Mr. Hobson on Higher Dynamics, Mr. Macaulay on Thermodynamics, and Mr. Forsyth on Higher Algebra. Dr. Besant lectures on Analysis, Mr. H. M. Taylor on Higher Plane Curves, Mr. Stearn on Electrostatics, Mr. Larmor on Theory of Conduction and Analytical Optics.

THE number of students inscribed in the several Universities of the Italian kingdom amounts to 15,151; excepting 200 who follow the free Universities, all of them follow the Government teachers, viz. law students, 5133; medical, 6132; science, 1627; literature and philosophy, 441. The largest number of students in proportion to the population is recorded in Central Italy, the largest number of law students in the Neapolitan States, the largest number of science students in Northern Italy, the largest proportional number of philosophical and literary students in Central Italy.

SCIENTIFIC SERIALS

The Quarterly Journal of Microscopical Science, No. ci., November 1885, contains:—On the relations of the yolk to the gastrula in Teleosteans and in other Vertebrate types, by J. T. Cunningham (plates 1-4).—On the structure and function of the sphæridia of the Echinoidea, by Howard Ayers (plate 5). Suggests that these organs have for their function the perception of chemical changes in the surrounding water (*i.e.* taste

and smell), and the reporting of the same to the nervous centres of the animal, from whence the intelligence is sent out to the spines and pedicellariæ, which latter are at once alert to secure the food-substance.—The nerve-terminations in the cutaneous epithelium of the tadpole, by A. B. Macallum (plate 6). The results are summarised as follows:—(1) Certain fibres of the nerve network, situated below the corium, and known as the fundamental plexus, give origin to fibres which enter the epithelium, and terminate in comparatively large bead-like bodies between the cells. (2) From a network of fine anastomising nerve-fibrils situated immediately below the epithelium, and forming meshes, each narrower than the surface covered by an epithelial cell, arise other excessively fine fibrils, which end either within or between the cells or after branching, in both fashions. (3) One, commonly two, often three or more, nerve-fibrils terminate in the interior of each epithelial cell near its nucleus. (4) The figures of Eberth are sheaths for intracellular nerve terminations.—On green oysters, by Prof. E. Ray Lankester (plate 7). The occurrence of a species of Navicula in the intestine of the green oysters of Marennes, is confirmed. The bluish pigment in the Navicula is described as "Marennin." The description and illustration of the secretion-cells of the epithelium of the branchiæ and labial tentacles of the oyster in which the Marennin absorbed in the intestine of green oysters is deposited follows, and it is proved that it is to this substance that the green parts owe their colour. The green oyster is very beautifully figured, of natural size, from a sketch by Miss A. Stone. The bluish pigment is, in the early spring, of a decidedly green hue.—The system of branchial sense-organs and their associated ganglia in Ichthyopsida: a contribution to the ancestral history of Vertebrates, by Dr. John Beard (plates 8–10).

American Journal of Science, December 1885.—On the effect on the earth's velocity produced by small bodies passing near the earth, by H. A. Newton. It is shown that the effect upon the earth's motion caused by the meteors that penetrate the earth's atmosphere, exceeds at least one-hundredfold that caused by the meteors that pass by without impact.—Sources of trend and crustal surplusage in mountain structures, by Alexander Winchell. The general meridional trend of the older mountain systems is discussed, and the cause of this orographic disposition is referred to the early period of incrustation. It is also argued that meridional trends would be further promoted by the secular subsidence of the earth's equatorial protuberance, as well as by lunar tidal action.—The genealogy and the age of the species in the Southern Old Tertiary, part iii., reply to criticisms, by Otto Meyer. In reply to Prof. Hilgard, the author maintains with further argument the original contention that only a competent and careful examination of the fossils could indicate the relations of the Old Tertiary strata of Mississippi. He also endeavours to show that Prof. Hilgard's views on the stratigraphical succession below Claiborne, Jackson, and Vicksburg are incorrect.—The condensing hygrometer and psychrometer, by Henry A. Hazen. Objections are raised against the condensing hygrometers now in use, such as those of Mr. Dines and Crova. An efficient psychrometer is described, with instructions for its use, and a table of relative humidity applicable to the sling psychrometer.—A new form of absorption cell, by Arthur E. Bostwick. The cell here described has been devised and used by the author for the purpose of obtaining the absorption-spectra of liquids, which have little selective absorption, and which would therefore have to be used ordinarily in large quantities.—Preliminary notice of fossils in the Hudson River slates of the southern part of Orange County, New York, and elsewhere, by Nelson H. Darton. Here the author deals with the fossils discovered in many new localities, which have thrown much light on the complicated stratigraphic structure of these districts.—Report of the American Committee-Delegates to the Berlin International Geological Congress, held September 28 to October 3, 1885, by Persifor Frazer, Secretary.—Bright lines in stellar spectra, by O. T. Sherman. Bright lines hitherto admitted to form part of but six stars, β Lyræ, γ Cassiopeiæ, and four small stars in Cygnus, are now detected by the 8-inch equatorial of Yale College Observatory in numerous other stars, a full description of which awaits the completed apparatus. The number of approximate coincidences renders it very probable that the lines observed are those of the solar atmosphere, and from these observations it would seem that there are many stars in the same condition as the sun, but with the corona more pronounced.—Note on the optical properties of rock-salt, by S. P. Langley. The most perfect rock-salt prisms procurable in Europe fail to show distinctly a single Frauenhofer line. But, after long searching, blocks have at last been obtained in America, from which prisms have been cut which show these lines with all the sharpness of flint glass. The prism here described, which has been made by Brashear of Pittsburgh, shows the nickel line between the D's.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, December 17, 1885.—"Second Report on the Evidence of Fossil Plants regarding the Age of the Tertiary Basalts of the North-East Atlantic." By J. Starkie Gardner. Communicated by Sir J. D. Hooker, K.C.S.I., F.R.S.

The position and physiography of this headland in the Isle of Mull has been fully described by the Duke of Argyll. It is the point of land separating Loch Laigh and Loch Scridain, and is about two miles in circumference and a mile across.

It is composed mainly of two sheets of basalt with remains of a third sheet, on some eminences and along the shore of Loch Laigh. These are almost horizontal, with a slight dip east, up Loch Scridain, and a considerable dip in the same direction up Loch Laigh. The upper sheet is not less than 40 to 50 feet thick, crystallised into rude massive columns, now much fissured and weathered, whilst the lowest presents a thickness of 60 feet, visible above low water, the upper two-thirds being amorphous, and the rest fashioned into slender and most perfect columns, bent in every direction, like those of the Clam-shell cave at Staffa. The beds are so exceedingly horizontal towards the seaward direction, that no one can doubt the columnar basalts of Staffa and the Treshnish Isles, Geometra and the mainland of Mull, being on the same horizon, if not parts of the same sheet. Between the two great lava-beds at Ardtun is intercalated a bed of sedimentary deposit, reaching a maximum of 60 feet thick, and consisting of pale very fine-grained clay and limestone at the base, then sand and gravel, black laminated shales, whinstone, gravel, and laminated sands. The gravels are made up of flint pebbles and subangular rolled fragments of older lava-beds in a matrix of broken-down volcanic material. They present all the ordinary lines of current bedding, beautifully weathered out, and the pebbles are drifted precisely as in ordinary river gravels.

There can be no question whatever, indeed, but that the gravels are the deposits of the waterway of a river of some magnitude, and the shales its overflows and backwaters. Its deposits traverse the whole seaward face of the headland, and their extension inland is marked by two beds of coal. An intrusive sheet of fine compact basalt rises on one side of the head, cutting a devious way through each bed in turn, and dipping beneath the sea at the other extremity. On the coast, near the centre of the head, occurs a small chine, apparently due to the weathering out of a vertical dyke, which has cut through the gravels and shales; it was here that I resolved to excavate them.

With the assistance of a barrel of powder and the removal of a mass of the intensely indurated shingle bed, to the extent of perhaps hundreds of tons, many square yards of the whinstone and the underlying black shales were exposed. The large specimens of *Platanites acerοides* and *Onoclea hebridica*, now exhibited, were the results. The ravine, however, proved an unfortunate selection, for the whinstone became poorer in fossils as we got farther in, and the underlying black shales, though crowded with leaves, were so squeezed and full of slickensides or faulted surfaces, and, consequently, so brittle, as to be practically valueless. From the condition of the shales and calcined appearance of the gravels—here of a steely-gray colour, intensely hard, with pure white and occasionally cherry-coloured flints, it is evident that the ravine must be the site of an old dyke, and if proof were wanting of a violent upthrust at this spot it is to be found in the upturned edges of the bottom bed on the west face. The succession of beds in the section we had been so laboriously working at in the ravine in no way prepared me for the discovery that within 100 yards there existed, many feet below the lowest sedimentary bed present in the ravine, a deposit of limestone, rivalling in fineness and texture the celebrated lithographic stone of Solenhofen, and containing ex-